Sergei Tretiak

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Personal:

Citizenship: Russia
Status in the USA: Permanent Resident
Marital Status: Married with two children

Education:

1998 Ph.D. in Chemistry, University of Rochester (Rochester, NY); Advisor: Prof. Shaul Mukamel
1994 M.S. in Physics (Highest Honors), Institute of Physics and Technology (Moscow, Russia)

Employment:

2001 – present Technical Staff Member, Theoretical Division, LANL
1999 – 2001 Director's Postdoctoral Fellow, Theoretical Division, LANL
1998 – 1999 Postdoctoral Associate, University of Rochester (Rochester, NY)
1994 – 1998 Graduate Student, University of Rochester (Rochester, NY)
1991 – 1994 Graduate Student, Institute of Spectroscopy of Russian Academy of Sciences

Research interests:

Relation between optical and chemical properties of organic and semiconductor materials; Development of modern computational methods for molecular optical properties; time-dependent density functional theory and semiempirical methods; Nonlinear optical response of organic chromophores; Adiabatic and non-adiabatic molecular dynamics of the excited states; Collective electronic excitations and optical response of confined excitons in conjugated polymers, carbon nanotubes, semiconductor nanoparticles, and molecular aggregates; Charge and energy transfer in biological and artificial antenna complexes; Ultrafast nonlinear spectroscopy; Nonlinear dynamics of complex classical and quantum systems.

Awards and Honors:

Slansky Fellow Award (2001), LANL Director's Postdoctoral Fellow (1999-2001), Arnold Weissberger Fellow (1997-1998), Graduate Student Award in Computational Chemistry (1996), Elon Huntington Hooker Fellow (1996-1997), Sherman Clarke Fellow (1996-1997), Diploma with Honor, Moscow Institute of Physics and Technology (1994).

Professional service

- Organizer of the conferences in the Center for Nonlinear Studies (CNLS) at Los Alamos National Laboratory: *"Excited State Processes in Electronic and Bio Nanomaterials (ESP)"*, 2001, 2003, 2005;
- Co-organizer of the 24th CNLS Annual Conference *"Statistical Physics of Macromolecules: from electronic structure to fluid mechanics"*, Santa Fe, NM, 2004;
- Manager of the Theoretical Division P/T Colloquium, Los Alamos National Laboratory, 2001-2005;
- Member of LDRD-ER review committee in Chemistry and Materials category (2005), in Technology category (2004), Los Alamos National Laboratory, 2005;
- Member of CNLS Executive Committee, Los Alamos National Laboratory, 2004-present;
- Member of CNLS public service committee, Los Alamos National Laboratory, 2001- 2003;
- Reviewer for about 15 major peer-reviewed journals and several funding agencies (NSF, Petroleum Research Fund (ACS), US Department of State for the Science Centers, *etc.*);
- Affiliations ACS/APS/MRS.

Training and mentoring of junior researchers:

Supervised 5 postdoctoral associates (A. Masunov, 2001-2004, currently junior faculty at USF, R. Magyar, 2003-2005, currently postdoc at NIST; A. Piryatinski, 2002-present; S. Goupalov, 2003-2004, currently at LANL; M. Lucero, 2005-present) and mentored over 15 summer graduate/undergraduate students at T-12/CNLS

Current collaborations:

within LANL: V. Klimov, A. Shreve, D. Smith, R. L. Martin, A. Saxena, A. R. Bishop, G. Berman, S. D. Doorn, D. Dattelbaum, H.-S. Wang.
outside LANL: S. Mukamel (UC Irvine), G. C. Bazan (UC Santa Barbara), D. Alara (PennState U.), A. Myers-Kelley (UC Merced), J. Perry, (GaTech), J. Lupton (U. Munich), V. Chernyak (Wayne State U.), M. Blanchard-Desce (University Rennes).

Selected invited talks (out of 30):

PacificChem 2005, Honolulu, Hawaii (2005); Winter School in Theoretical Chemistry on Nanophotonics, University of Helsinki, Finland (2005); 230th ACS National Meeting, Washington DC (2005); Conference on Nonadiabatic Dynamics, Telluride (2004); Binational Consortium On Nonlinear Optics (Winter School), UA (2004); The Third International Symposium on Optical Power Limiting, Arizona (2003); ACS National Meeting, New Orleans (2003); MRS National Meeting, Boston (2002); Wright-Patterson Air Force Base, Dayton (2002); Gordon Research Conference on Computational Chemistry, New London (2002); MRS National Meeting, Boston (2001); ACS National Meeting, San Diego (2001); ACS National Meeting, San Francisco (2000).

Selected publications (out of 70):

1 A. Piryatinski, M. Stepanov, S. Tretiak, and V. Chernyak, ”Semiclassical Scattering on Conical Intersections”, *Phys. Rev. Lett.*, **70**, 223001 (2005).
2 E. A. Badaeva, T. V. Timofeeva, A. Masunov, S. Tretiak, ”Role of donor-acceptor strengths and separation on the two-photon absorption response of cytotoxic dyes: a TD-DFT study,” *J. Phys. Chem. A*, **109**, 7276 (2005).
3 I. Franco and S. Tretiak, ”Electron-vibrational dynamics of photoexcited polyfluorenes,” *J. Am. Chem. Soc.*, **126**, 12130 (2004).
4 A. Masunov and S. Tretiak, "Prediction of two photon absorption properties for the large organic molecules using the time-dependent density functional theory," *J. Phys. Chem. B*, **108**, 899 (2004).
5 S. Tretiak, R.L. Martin, A. Saxena, A.R. Bishop, "Photoexcited breathers in conjugated polyenes: an excited state molecular dynamics study," *Proc. Natl. Acad. Sci. USA*, **100**, 2185 (2003).
6 S.A. Crooker, J. Hollingsworth, S. Tretiak, and V.I. Klimov, "Spectrally resolved dynamics of energy transfer in quantum-dot assemblies: engineered energy flows in artificial materials," *Phys. Rev. Lett.*, **89**, 6802 (2002).
7 S. Tretiak and S. Mukamel, "Density matrix analysis and simulation of electronic excitations in conjugated and aggregated molecules," *Chem. Rev.*, **102**, 3171 (2002).
8 S. Tretiak, A. Saxena, R. L. Martin, and A. R. Bishop, "Conformational dynamics of photoexcited conjugated molecules," *Phys. Rev. Lett.*, **89**, 97402 (2002).
9 S. Mukamel, S. Tretiak, Th. Wagersreiter, and V. Chernyak, "Electronic coherence and collective optical excitations of conjugated molecules," *Science*, **277**, 781 (1997).
10 S. Tretiak, V. Chernyak, and S. Mukamel, "Chemical bonding and size scaling of nonlinear polarizabilities of conjugated polymers," *Phys. Rev. Lett.*, **77**, 4656 (1996).